

1. (Amended) [Method] A method of modifying the geometric orientation of a digital image [(1)] in an image acquisition apparatus [(20)] adapted to acquire an image [(1)] in one amongst several different orientations and to store said image in the form of a compressed file, characterised in that it comprises the following steps:

[-] acquiring [(E1)] an image [(1)] in a chosen orientation;

[-] identifying [(E2)] said chosen orientation;

[-] converting [(E3)] said image into a digital image;

[-] spectral [transformation (E10) of] transforming said digital image;

[-] determining [(E12-E15)] a geometric transformation to be applied to said image acquired as a function of the chosen orientation;

[-] applying [(E16-E18)] the geometric transformation determined to symbols associated with spectral coefficients issuing from said spectral [transformation] transforming;

[-] recording [(E20)] in the compressed file two indicators [(lh, lv)] representing a normal or reversed

order of the symbols respectively in two directions of the digital image [(1)]; and

[-] coding [(E21)] the digital image in said compressed file.

2. (Amended) [Geometric] The geometric orientation modification method according to Claim 1, characterised in that it includes a step [(E11)] of quantizing the spectral coefficients before the step [(E16-E18)] of applying the geometric transformation, said symbols being quantization symbols.

3. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 or 2] Claim 1, characterised in that said spectral [transformation] transforming is a multiresolution decomposition, such as a wavelet spectral decomposition.

4. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 to 3] Claim 1, characterised in that the step [(E12-E15)] of identifying the chosen orientation is implemented by an

automatic orientation detector [(27)] incorporated in said image acquisition apparatus [(20)].

5. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 to 3] Claim 1, characterised in that the step [(E12-E-15)] of identifying the chosen orientation is implemented by a manual orientation selector [(28)] incorporated in said image acquisition apparatus [(20)].

6. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 to 5] Claim 1, characterised in that the image acquisition orientation is chose from amongst a rotation through 90 degrees, a rotation through 180 degrees or a rotation through 270 degrees.

7. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 to 6] Claim 1, characterised in that said spectral transformation is a multiresolution spectral decomposition, such as a wavelet spectral decomposition, and in that it also comprises a step of transposition [(E19)] of a frequency sub-

band $[(HL_1, HL_2, HL_3)]$ having coefficients of low frequency in a first direction of the digital image and of high frequency in a second direction of the digital image with a frequency sub-band $[(LH_1, LH_2, LH_3)]$ of the same resolution level in the spectral decomposition, having coefficients of high frequency in said first direction and of low frequency in said second direction when the geometric transformation comprises a rotation through 90 degrees or 270 degrees.

8. (Amended) [Geometric] The geometric orientation modification method according to [one of Claims 1 to 7] Claim 1, characterised in that it also comprises a step of transposition $[(E19)]$ of the values of the height and width of the image when the geometric transformation applied comprises a rotation through 90 degrees or 270 degrees.

9. (Amended) [Device] A device for modifying the geometric orientation of a digital image $[(1)]$ incorporated in an image acquisition apparatus $[(20)]$ adapted to acquire an image in accordance with one amongst several different orientations and to store said image in the form of a compressed file, having:

[-] means [of] for acquiring [(21,22)] an image [(1)] in a chosen orientation;

[-] means [of] for identifying [(27, 28)] said chosen orientation;

[-] means [of] for converting [(23)] said image into a digital image;

[-] means [of] for spectral transformation [(24, 29, 30)] of said digital image;

[-] means [of] for determining [(24, 29, 30)] a geometric transformation to be applied to said image acquired as a function of the chose orientation;

[-] means [of] for applying [(24, 29, 30)] the geometric transformation determined to symbols associated with spectral coefficients issuing from said spectral transformation;

[-] means [of] for recording [(24, 29, 30)] in the compressed file two indicators [(lh, lv)] representing a normal or reversed order of the symbol respectively in two directions of the digital image [(1)]; and

[-] means [of] for coding [24, 29, 30)] the digital image [(1)] in said compressed file.

10. (Amended) [Geometric] The geometric
orientation modification device according to Claim 9,
characterised in that it has means [(24, 29, 30) of] for
quantizing the spectral coefficients adapted to quantize said
spectral coefficients before application of the geometric
transformation, said symbols being quantization symbols.

11. (Amended) [Geometric] The geometric
orientation modification device according to [one of Claims 9
or 10] Claim 9, characterised in that said spectral
transformation is a multiresolution spectral decomposition,
such as a wavelet spectral decomposition.

12. (Amended) [Geometric] The geometric
orientation modification device according to [one of Claims 9
to 11] Claim 9, characterised in that the means [of] for
identifying the chosen orientation comprise an automatic
orientation detector [(27)] incorporated in said image
acquisition apparatus [(20)].

13. (Amended) [Geometric] The geometric
orientation modification device according to [one of Claims 9
to 12] Claim 9, characterised in that the means [of] for

identifying the chosen orientation comprise a manual orientation selector [(28)] incorporated in said image acquisition apparatus [(20)].

14. (Amended) [Geometric] The geometric orientation modification device according to [one of Claims 9 to 13] Claim 9, characterised in that the image acquisition orientation is chose from amongst a rotation through 90 degrees, a rotation through 180 degrees or a rotation through 270 degrees.

15. (Amended) [Geometric] The geometric orientation modification device according to [one of Claims 9 to 14] Claim 9, characterised in that said spectral transformation is a multiresolution spectral decomposition, such as a wavelet spectral decomposition, and in that it also comprises means [of] for transposition [(24, 29, 30)] of a frequency sub-band [(HL₁, HL₂, HL₃)] having coefficients of low frequency in a first direction of the digital image and of high frequency in a second direction of the digital image with a frequency sub-band [(LH₁, LH₂, LH₃)] of the same resolution level in the spectral decomposition, having coefficients of high frequency in said first direction and of

low frequency in said second direction when the geometric transformation comprises a rotation through 90 degrees or 270 degrees.

16. (Amended) [Geometric] The geometric orientation modification device according to [one of Claims 9 to 15] Claim 9, characterised in that it also has means [(24, 29, 30) of] for transposing the values of the height and width of the image when the geometric transformation applied comprises a rotation through 90 degrees or 270 degrees.

17. (Amended) [Geometric] The geometric orientation modification device according to [one of Claims 9 to 16] Claim 9, characterised in that the means for the spectral transformation of said digital image, the means [of] for determining a geometric transformation, the means [of] for applying the geometric transformation, the means [of] for entering indicators [(lh, lv)] in the compressed file, the coding means, and if applicable the quantization and transposition means, are incorporated in:

[-] a microprocessor [(24)],

[-] a read only memory [(29)] containing a program for modifying the geometric orientation of a digital image [(1)], and

[-] a random access memory [(30)] containing registers adapted to record variables during the running of said program.

18. (Amended) An image processing method,
comprising the steps of;

[-] generating image data representing an image;

[-] wavelet-transforming the image data;

[-] quantizing the transformed data; and

[-] entropically encoding the quantized data,
characterized in that said method further comprises the steps of:

[-] identifying a correct orientation of the image represented by the image data, and

[-] applying a geometric transformation to the transformed data in accordance with the result of the identification.

22. (Amended) An image processing apparatus,
comprising:

[-] means [of] for generating an image data
representing an image;

[-] means [of] for wavelet-transforming the
image data;

[-] means [of] for quantizing the transformed
data; and

[-] means [of] for entropically encoding the
quantized data, characterized in that said apparatus further
comprises:

[-] means [of] for identifying a correct
orientation of the image represented by the image data; and

[-] means [of] for applying a geometric
transformation to said transformed data in accordance with
the result of the identification.

26. (Amended) [Image] An image acquisition
apparatus, characterised in that it has a geometric
orientation modification device according to [one of Claims 9
to 17] Claim 9.

27. (Amended) [Digital] A digital photographic apparatus, characterised in that it has a geometric orientation modification device according to [one of Claims 9 to 17] Claim 9.

28. (Amended) [Digital] A digital camera adapted to function in a still image mode, characterised in that it has a geometric orientation modification device according to [one of Claims 9 to 17] Claim 9.

29. (Amended) [Storage] A storage means, readable by a microprocessor, characterized in that it is adapted to implement the geometric orientation modification method according to [one of Claims 1 to 8] Claim 1.

30. (Amended) [Storage] A storage means, readable by a microprocessor, characterized in that it is adapted to implement the image processing method according to [one of Claims 18 to 21] Claim 18.

31. (Amended) [Computer] A computer program product, loadable into a programmable processing apparatus, characterized in that it comprises software code portions